1**What is Amber** and some facts found on Amber research pages of the world

These are just a few copied facts from amber web pages available by typing in the search window “Baltic Amber” Please enjoy reading some of the facts these people have garnished with years of research and are now available to us on the net.

- Amber is the fossilized resin or sap of the pine tree Pines Sucinifera formed during the Eocene period about 50,000,000 years ago.
- Amber is the sacred stone of American Indians, and it is used in the art of manifesting desires into reality.

Welcome to the World of Amber

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Million years ago large stands of forests in some parts of the world began to seep globs of sticky resin! This aromatic resin oozed down the sides of trees, as well as filling internal fissures, trapping debris, such as seeds, leaves, feathers and insects. As geologic time progressed the forests were buried and the resin hardened into a soft, warm, golden gem, known as amber. Amber is the fossilized resin of ancient trees which forms through a natural polymerization of the original organic compounds. Most of the world's amber is in the range of 30-90 million years old.

Amber is known to mineralogists as succinite, from the Latin succinum, which means amber. Heating amber will soften it and eventually it will burn, a fact that has given rise to the name of bernstein, by which the Germans know amber. Rubbing amber with a cloth will make it electric, attracting bits of paper. The Greek name for amber is elektron, or the origin of our word electricity. Amber is a poor conductor of heat and feels warm to the touch (minerals feel cool). The modern name for amber is thought to come from the Arabic word, amber, meaning ambergris. Ambergris is the waxy aromatic substance created in the intestines of sperm whales. The substance is related to cholesterol and is formed to protect the sperm whale from the sharp beaks and stings of its major food source, the giant squid. Ambergris was used to make perfumes. Ambergris and amber are only related by the fact that both wash up on beaches.

Therefore, amber is formed as a result of the fossilization of resin that that takes millions of years and involves a progressive oxidation and polymerization of the original organic compounds, oxygenated hydrocarbons. Although a specific time interval has not been established for this process, the majority of amber is found within Cretaceous and Tertiary sedimentary rocks(approximately 30-90 million years old).

Why is resin produced?
Although there are contrasting views as to why resin is produced, it is a plant's protection mechanism. The resin may be produced to protect the tree from disease and injury inflicted by insects and fungi. Resin may be exuded to heal a wound such as a broken branch, and resins possess odors or tastes that both attract and repel insects (Langenheim, 1969, p. 1167). In mature trees, resin may simply exude from vertical fissures in the bark due to tension produced by rapid growth (Langenheim, 1969, p. 1166). Resin may also be produced as a plant's method for disposing of excess acetate.

What is amber's botanical affinity?
There is no one tree responsible for the resin that fossilizes into amber. Botanical affinities have been suggested based on examination of the entombed debris and through chemical studies of the resin. The botanical affinity of jelinite, Kansas amber, appears to be from the Araucariaceae family, which is considered to be a primary Mesozoic amber tree. Although this tree does not exist today in the northern hemisphere, it would closely resemble Agathis australis, or the huge Kauri pine found today in New Zealand.

During most of the Mesozoic geologic time period, gymnosperms dominated land vegetation. Conifers are the most successful gymnosperm living today (Cleal & Thomas, 1999, p. 62). Some of the amber land plants were probably conifers from the order Pinales, in the families: Araucariaceae (e.g., Norfolk Pine, Monkey Puzzle, Kauri Pine), Taxodiaceae (e.g., sequoias and bald cypresses), Taxaceae (e.g., yews), Pinaceae (e.g., pine and larches), Cupressaceae (e.g., cedars, cypresses, junipers), and Podocarpaceae.

Studies by Göppert (1836), based on botanical debris entombed in amber, concluded that members of the Pinaceae were the source of Baltic amber. Specifically, Göppert (1836) designated the amber tree as Pinites succinifer, although he clearly stated this wood anatomy was not the same as any living pine today. Disregarding botanical evidence and concentrating on chemical evidence, Beck (1999) and Larsson (1978) suggested sources other than Pinaceae for Baltic amber, including Araucariaceae, Cupressaceae, and Taxodiaceae; they believed that chemically Göppert's Pinites was a closer match to the Araucariaceae than to Pinaceae.

What type of depositional environment preserved amber?

One depositional environment for amber is marginal marine. Amber's specific gravity is slightly over 1 and it floats in saltwater; therefore amber becomes concentrated in estuarine or marine deposits, moved some distance from the original site (Langenheim, 1969, p. 1159). Trees and resin may be transported and deposited in quiet water sediments that formed the bottom of a lagoon or delta at the margin of a sea. Wood and resin are buried under the sediment and while the resin becomes amber, the wood becomes lignite. Wet sediments of clay and sand preserve the resin well because they are devoid of oxygen.

Therefore, given copious resin producing trees and appropriate burial conditions, amber is preserved in sedimentary clay, shale, and sandstones associated with layers of lignite, a woody brown coal. A generalized interpretation of the depositional conditions present in Kansas amber-bearing strata is that a transgressing or advancing Cretaceous sea in north-central Kansas led to

deposition and preservation of fluvial, estuarine, and lagoon or bay deposits behind a barrier island system (Franks, 1980, p.
Briefly about amber

Baltic Amber, or succinite as it is referred to by mineralogists, is the best quality fossil resin and was the first to have been discovered. Its organic origins are no longer a mystery to anyone.

Succinite is characterised by an amber acid content of between 3% and 8%. This amount of amber acid is the feature which elevates Baltic amber above all remaining fossil resins.

Plant inclusions in amber

Whole lichens, liverworts or mosses that make it possible to identify the species or genus are rarely found. Larger plant fragments, such as flowers, fruits, seeds, needles, leaves or twigs, are also rarities. The most often encountered inclusions are small fragments of plant tissues and organs, but such remnants are usually impossible to identify. The most common traces of Eocene angiosperms in the Baltic amber are stellate hairs from scales that protect oak buds.

The amber forests are comparable to the present-day subtropical communities of mountain regions of south-eastern Asia. Rivers flowing through the forested areas transported, among others, small and larger dripstone forms of resin, as well as whole coniferous tree trunks with resin accumulated in various cracks. All this resin material, hidden in estuary sea deposits, underwent gradual physical and chemical transformations, resulting in amber lumps found today.

Primary and secondary varieties of Baltic amber

The varieties of Baltic amber can be divided into primary and secondary. The main basis for further division in the group of primary varieties is the internal structure of amber which determines its transparency and colour. The transparency and colour of amber depend on the number and arrangement of gas bubbles in the lump.

The group of primary varieties, depending on the internal structure, includes: (1) transparent amber, (2) translucent amber, (3) opaque yellow amber, (4) opaque white amber, in which the internal structure is that of a solid foam, while the colour is white, sometimes bluish.

B. Kosmowska-Ceranowicz, K. Leciejewicz, K. Kwiatkowska és A. Pielin'ska

Types of amber

One method of classifying amber is by color and degree of transparency. This criteria correlates to an optical classification of amber varieties. **Colors of amber include yellow, orange, red, white, brown, green, bluish, and "black" (dark shades of other colors). The degree of transparency varies in amber from clear to cloudy. Clear amber is transparent and usually ranges from pale yellow to dark reddish yellow. Cloudy amber can be semi-transparent to opaque, a variety of colors and separated into terms such as fatty, bone (or osseous) or foamy (or frothy).**

Fatty amber does not necessarily imply a green color. Fatty amber has tiny bubbles, suspended dust particles, and is usually a translucent, yellowish color resembling goose fat or also compared with the look of whipped honey.

Green amber has tiny bubble inclusions and suspended particles, but it does not have the yellowish appearance of fat. The green color probably results from decaying organic matter in a marsh environment. Bone or osseous amber is whitish yellow or brown in color, opaque and looks similar to ivory or bone. Black decayed organic debris is commonly found in this type of amber. Foamy or frothy amber is very soft and therefore incapable of taking a polish. It is opaque and usually contains pyrite infilling cracks.

Other descriptive names for amber exist, reflecting not only color and degree of transparency but also chemical composition, the degree of weathering, places of discovery, workability, and functions in folk rituals. In Poland, some 200 folk names are applied to amber and some 80 variety names. "Soily" amber is described as brown or green, and full of gas bubbles and debris due to the decaying organic matter.

Another mode of classifying amber, a physical classification, is based on procurement, land or sea.

- **Sea stone and scoopstone refers to amber found in or near the sea.**
  Scoopstone is the amber gathered from seaweed.
- **Sea stone or sea amber is collected as it is washed onto the** beach or directly from the water (amber floats in salt water).
- Some amber procured on land is termed **pit amber**. Pit amber is mined from rock strata called "blue earth" and the source of most Baltic amber. This amber is covered with a crust, which obscures the quality of the piece.
- Sea amber is usually superior to mined amber because the waves provide polish, a uniform quality and there is no crust on the surface. Amber can also be found on land in secondary or alluvial deposits. Alluvial deposits indicate the material has been transported away from the primary source by erosional agents such as wind, water or glaciers.

Another physical classification system is the natural form in which amber is found.

- There are both external and internal tree trunk amber forms. External amber forms are the result of resin extruded by the trunk. This creates various shapes and sizes that can preserve trunk imprints as well as debris. Internal amber forms are the result of resin in filling fissures and extended wounds within the tree trunk.
- These casts (filling in a mold) can be large lumps or tiny, flat plates with imprints on both the convex and concave surfaces. The lumps can originate during the healing of wounds, such as broken branches, and the flat plates could be filling cracks or resin pockets between annual growth rings.
- One external dripping form can be termed a stalactite, elongate and conical, with a somewhat concentric structure resulting from multiple outpourings of resin. Internal crack filling forms can also be elongate, but the structure shows the axis is parallel to the direction of flow, not concentric.

Finally, amber can be classified based on chemical composition , usually as one of two fossil resins: succinite or retinite. Baltic amber or succinite was once thought to be the only "true" amber and is the most suitable for jewelry.
Gedanite is found with Baltic amber and thought to be resin from an extinct white pine species. It was first found near Gdansk, which is now in Poland but then called Gedania. Krantzite and gedanite are both rare varieties of Baltic amber, that is they contain some succinic acid, but both have lower hardness and other differing properties from Baltic amber or succinite. Beckerite is also found with Baltic amber, though nicknamed "brown resin".

Geologic Occurrence of Amber
The composition, color, and other physical properties of amber all vary according to age, conditions of burial, and type of tree that produced the resin. Amber has been found in sediments from the Carboniferous to Quaternary age, but the greatest concentration is in Cretaceous and Tertiary sediments. Below is a geologic time frame relating to amber formation, based on Jean Langenheim's work with amber/botanical affinities reproduced in Rice: Amber the Golden Gem of the Ages, the Polish Academy of Sciences: Amber in Nature, a German publication: Lausitzer Bernstein, and Grimaldi: Amber Window to the Past. Mark Meyer has created a timeline for the presence of amber within the geologic time scale that is worth visiting too!

* Carboniferous/360-285 million years ago (mya): United Kingdom; U.S.A.= Montana.

* Permian/285-245 mya: CIS=Russia.

* Triassic/245-215 mya: Austria.

* Jurassic/215-145 mya: Denmark=Bornholm.

* Cretaceous/145-65 mya: U.S.A.=Maryland, Massachusetts, New Jersey, New York, Delaware, North Carolina, Tennessee, Arkansas, South Dakota, Nebraska, Kansas, Texas, New Mexico, Montana, Alaska, and California; Canada= Manitoba, Alberta, British Columbia; Mexico; Brazil; Poland; Denmark=Bornholm, Greenland; Austria; Switzerland; Hungary; Spain; France; United Kingdom; Isreal; Lebanon; CIS=Russia (Siberia); Myanmar (formerly Burma); Japan; Borneo.

* Tertiary/65-2 mya: Sweden; Poland; Germany; Denmark; Lithuania; Latvia; Estonia; CIS=Russia (Samland), Sakhalin, Armenia, Azerbaijan, Ukraine; Romania; United Kingdom; Italy=Sicily; Netherlands; Africa=Nigeria; Australia; New Zealand; Sumatra; Borneo; Java; Philippine Islands; Japan; Myanmar (formerly Burma); China; Argentina; Brazil; Ecuador; Chile; Colombia; Haiti; Dominican Republic; Mexico; U.S.A.=Washington, California, Arkansas, Texas, and Massachusetts.
* Quaternary/2 mya-recent: Isreal; Africa=Angola, Tanzania, Sierra Leone, Congo; Madagascar; India; New Zealand; Philippine Islands; U.S.A.=Alaska; Sweden; Germany; Poland.

It is difficult to determine if the amber in sediments is primary or secondary. Primary deposits are insitu. Secondary deposits are where amber is found after transportation by rivers, transgressing seas, glaciers or fluvioglacial waters. Up until 1860 amber procuring methods were off the

beaches and with shallow diving. It was obvious that sea amber came from strata beneath the sea and a larger supply could be obtained by dredging or mining.

Amber in the Baltic Region

The Baltic Sea region has been the original source for amber since Prehistoric times. Although it is not known exactly when Baltic amber was first used, it can be linked to the Stone Age populations. Amber of Baltic origin was found in Egyptian tombs that date back to 3200 B.C., establishing the archeological barter and trade routes. Germany, Poland, Lithuania, Latvia and Estonia have some 100 Neolithic burial sites in which amber is included. European sea trade was dominated by the Vikings from 800-1000 A.D., with the "gold from the north", and Scandinavia continues to be a major exporter of amber today. For information may be found on amber archeology and trade routes on the recovery page.

In early times, amber was the absolute property of the finder. As amber became a lucrative business in the Baltic region, dukes, kings, Teutonic knights and different countries tried to control the collection and sale of this commodity. Fishing rights were granted and rescinded by the "Amber Lords" as early as 1264 A.D. When amber was collected without supervision of a "Beach Master" or "Beach Rider", the unauthorized persons were hung. Amber guilds were formed in the 14th century to create rosaries and works of art from the raw material supplied by the Amber Lords. In the 17th century, fishermen had to swear to the "Amber Oath", which denounced amber smugglers, and searching for amber was not an option but a requirement. Some amber fishermen were paid in salt (interesting link though not directly related to amber and the site loads slowly) for their raw amber, weight for weight.

Forty, fifty or some million years more ago resin was dripping down the trunks of the prehistoric pine woods. Insects, seeds of plants, little frogs, even small lizards got trapped in the tacky surface of the "tears of gods" as the ancient Greek called amber. Caught and covered by the resin, hardened by time they were preserved till our time.

Like the Silk Road in Asia the Amber Road connected different cultures and nations between the Baltic and the Adriatic sea

The project European Amber Road shall build up a network of museums and historical sites along this old European connection.

1755 some decorations were added to the Amber Room and it was transfered to the imperial summer residence of Zarskoje Selo, now called Puschkin, outside of St. Petersburg. With its ornaments, decorations, furniture and objects, all made of amber, it was the most precious room of the Csars for nearly 200 years. But in WWII the Germans brought the Amber Room to the castle of Koenigsberg, now Kaliningrad, where it vanished 1945. Maybe it was destroyed too when the castle burned down, maybe it is still hidden somewhere, nobody knows the truth.

But 1999 a new Amber Room was opened to the public - again in the Summer palace of Puschkin

Uses of Amber
In the 1920's one-half of the production of amber went for the manufacture of articles for smokers, cigar/cigarette-holders, mouth-pieces for pipes. The main finished products of amber can be divided into four categories: jewelry, smoking articles, objects of art, and devotional articles. Jewelry includes necklaces, bracelets , brooches, earrings, pendants, finger rings, cufflinks, teething rings for children, etc. Smoking articles were mentioned above. Another utilitarian use was with balls of amber, that were used to remove lint from clothing because of the ability to generate static electricity by rubbing! Objects of art are items like: carvings, jewelry boxes, cups and dishes, writing utensils, ornaments, chess sets, mosaic pictures, chandeliers. View the beautiful amber ship and amber cabinet. The ship was created in Königsberg by 1934, while the amber cabinet was made in Königsberg before 1742 and currently located in Dresden, Germany. A stunning ornamental amber egg was presented to Gdansk, Poland in honor of the city's 1000th anniversary (!) from a Mrs. Heidrun Mohr-Mayer. Other objects of art include devotional items, such as: Catholic, Moslem and Buddist rosaries, sacred figures, and amulets. For some, amber has magical powers, such as these red and green amber metaphysical tools (page down for the amber tools).

Amber and other fossil resins have a practical side too when they are used for varnish and lacquers, and burned as incense. In ancient times the aroma was appreciated in order to camouflage the odor of spoiled food. Modern resin or gum (pine pitch) is used in the production of rosin, turpentine, creams and oils for the perfume industry (Novgorod Province, Russia, Bor Experimental and Industrial Chemical Forestry). Fine amber varnish is applied to violins.

Amber has even been used as a building material. Amber created the alter in St. Brygida Church, Gdansk, Poland. In St. Petersburg, Russia, the walls of the famous Amber Room (image to the right) were lined with intricate carvings and inlaid designs. This palace room is being reconstructed from photographs, and can be visited at Palace of Catherine of Tsarskoye Selo.

Amber has been known since prehistoric times and stone age artifacts are common in museums, such as these from the National Museum of Denmark located in Copenhagen. Amber beads have been found in 4000 year old graves near Stonehenge, England. Amber beads (from the National Museum in Copenhagen, Denmark), amulets, carvings have all been found in archaeological sites throughout northern Europe and along the Mediterranian and Asia. More information on amber use and archeological finds, which are both found at Gintaro Galerija Muziejus.

Myths and Truths about Amber

Amber has a unique charm and air of mystery surrounding it. Amber can contain mosquitos and microbes have been extracted, but not from dinosaur blood enclosed in the stomach of the mosquito. Amber was recently popularized by the book and movie, Jurassic Park, in which the DNA extracted from dinosaur blood within the mosquito, was used to reproduce dinosaurs. Technology has allowed for the extraction of DNA from animals and insects trapped in amber.

Amber Used as Medicine
Honey was mixed with powdered amber and prescribed for asthma, gout, and the black plague. Amber pendants were worn to preserve chastity, and used as rosary beads or talismans against evil and dark forces. Amber was burned along with non-fossil tree resins, such as frankincense, myrrh, and copal to dispel evil spirits and fumigate worldly nuisances such as mosquitos. Sailors burned amber on ships to drive away sea serpents and the perils of the deep. Today amber is still used as a medicine! This was purchased recently in Poland. For more information visit Amber in Medicine.

If you ask any Lithuanian about the origin of amber, most probably you will hear a legend of an unhappy love between goddess Jurate. and fisherman Kastytis. God Perku-nas, after finding out that the mortal son of earth dared to touch the Goddess of the Baltic's, threw down a bolt of lightning, which shattered the amber palace on the bottom of the sea and drowned Kastytis together with his boat. Ever since waves have been washing ashore pieces of amber - fragments of the palace and after storms the shore is strewn smaller pieces - Ju-rate.'s tears that she is still continuing to shed.

Scientists say that amber (or succinite) is a fossil pine resin that has achieved a stable state through oxidation, action of micro-organisms and other processes. If we want to image how everything happened, we should travel some tens of millions of years back to the southern regions of the present-day Scandinavia and nearby regions of the bed of the Baltic Sea (the formation of the Baltic Sea began only 13 thousand years ago) where conifer forests grew more than 55 million years ago.
The climate became warmer and conifer trees started to exude big amounts of resin. Any smallest wound caused excessive flow of resin. Of course, today there is no one type of pine which had similar characteristics to those of the fossil trees.

AMBER FOREST

The transformation of resin into amber continued from the moment of secretion until its burial into Sambia deposit. Due to various processes resins underwent different changes and a material which was not similar to the original resins was formed. Later amber was washed out and brought to different river backwaters. The layer of amber was covered by delta sediments and survives to the present day. One cubic meter of this rock, which is called blue ground, contains from 0,5 to 2,5

kilogram amber. The biggest known deposit of amber is 7-8 meter thick layer of such ground 30-40 cm below sea level near Palvininkai.
It is thought that in the whole region of western Sambia Peninsular there are several hundred thousand tons of amber, and in Courland Lagoon, near Juodkrante., 3000 hectares of amber-containing ground have been found.
In this region of Baltic sea aproximately 90 per cent of all amber (fossil resins) in the world are found.

Literature

MORPHOLOGY

Observing natural amber pieces we can understand the way resins had been dripping and gliding. Some amber has regular shape of a drop, others hardened into icicles, much of resins moved by a trunk on the ground and hardened into lumps or gathered under a bark or just in a trunk.

There are two morphologic species of amber. One is interior lens formed from initial resins in various parts of bark and wood, the other one is superficial icicles, drops or trunk amber formed by outpouring of resins along the surface. 80% of amber is superficial amber. Most of inclusions are in this one. Good-looking morphologic species of amber are rare. Only fragments of them broken and rubbed are usually found. Knowing their own features it is easy to define the species.

In a trunk resins are in particular channel system perfectly isolated from other vessels of wood; pressed tightly (to 20 atm); that is why after breaking channels they outpour easily.

"A drop of amber from the weeping plant,
Fell unexpected and embalmed an ant,
The little insect we so much condemn,
Is, from a worthless ant, become a gem."
By the Roman poet, Marcus Martial, (40 - 102A.D.)

Jewelry made from amber has been found in Northern European tombs dating from 8000 B.C. making it one of the oldest forms of jewelry.

Centuries ago when the earth was much warmer, the great pine forests of Northern Europe grew in profusion, their trees oozing a resin similar to cherry gum which was broken off by frost and time to be swept into the sea where it hardened and, in the Spring, was thrown up on the shorelines. Bees, flies, mosquitoes and other insects as well as seeds and leaves were trapped in the soft, sticky resin as it fell from the trees, to remain there forever. These pieces are the most valuable and much sought after by collecectors, scientists and natural history museums.

Ancient tribes marveled at the stone and its warmth believing it to be solidified sunshine, others thought it was the petrified tears of the gods and, in later years, it became a great trading medium for the Poles as the Romans and Phoenicians believed it warded off evil spirits. It was made into jewelry and used to decorate swords and weaponry and carried into battle as an aid to winning, even being entwined in the horse's mane and tail. It shone in an unusual way and when rubbed had

a pleasant scent making it much sought after by the Greeks, Romans and people of the time who called it "Northern Gold."

It occurs in colors ranging from nearly white to yellow to brown; green is rarer and blue, black and red are very rare. Trapped gas and air bubbles contribute to its beautiful luster and translucency, (opacity.) Its value and quality is judged by its clarity, shine, beauty of color and its inclusions. Being 40 - 60 million years old, it is perhaps the oldest window to our past.

An entire prehistoric ecosystem is trapped inside the resin known as amber! Because amber oxidizes, degrading when exposed to oxygen, it is preserved only under special conditions. Thus, it is almost always found in wet clay and sand sediments formed at the bottom of ancient lagoons and river deltas. Only about twenty deposits of amber in the world contain enough substance to be mined. No one is certain how the world within amber survives intact but it is thought that terpenes, compounds that become linked as the resin hardens, help to preserve the inclusions or organisms by dehydrating them and killing any bacteria that may cause decay. The organisms' tissues do not shrink as they normally would during the process, and as a result, their cellular structure remains intact, making these inclusions perfect for DNA study.

From the Age of Dinosaurs to the Present Day

Amber from the Cretaceous period, 65 o 140 million years ago offers the earliest glimpse of many life forms. Flowering plants, now the dominant life form on earth, evolved with bees, moths and other symbiotic insects. This amber is highly brittle and rare. The largest deposits found in Northern Russia. In Kuji, Japan, there are pieces believed to be 85 million years old. In the United States, the largest quantities have been found in the state of New Jersey, dated around 65 milllion years old.

Tertiary amber, considered to be 1.6 to 65 million years old is found worldwide, but deposits vary greatly, occurring on every continent except Antarctica. The largest North American deposit from this period has been found in Arkansas. Baltic Amber comes from the world's largest deposits, centered around the 400-square mile Samland Peninsula, producing 90% of the amber sold in Europe. Twenty three to thirty million year old Dominican amber is prized for its variety of inclusions. It is slightly softer than Baltic amber and was produced from the Hymenaea tree, a now extinct tree of the legume family.

Amber as Art

Art is a form of human expression, and as such, was first expressed using the medium of amber during the Mesolithic and Neolithic (Stone Age) periods (9,000-3,000 B.C.). Amulets as a form of protection were sometimes found during this age. In the Bronze and Iron ages, amber was traded in the Baltic with Mediterranean peoples in exchange for copper, probably for utilitarian purposes. The Etruscans and Romans valued the substance higher than gold and carved beads and human figures with it.

The Extraordinary Amber Room

A gift from the Prussian King Frederick William I to Czar Peter the Great, the walls of this chamber, consisting of twenty two panels—were completely covered in a mosaic of more than 100,000 intricately carved pieces of amber. In 1755 the chamber was installed in the Ekatrarininsky Palace outside St. Petersburg, where it remained for nearly two centuries. The panels were dismantled and hidden by Nazis in 1942. They have never been recovered.

Amber can be used to help the bladder, heart, kidneys and spleen, and strengthen the internal organs in general. It alleviates allergies and asthma and is believed to clear one's surroundings of environmental toxins and negativity. It is said to bring unconditional love, which may be why it is also said to help find one's soul mate, help families bond, and influence world peace, something so needed in these times. It is also said to ease grief and depression, and to bring good luck to warriors. Sadly, we need Amber for these qualities now, as well.

Baltic Amber - sun stone

Amber region - it's the furthest west area of Russia, whose environmental innermost depths generously give their unique creation - amber.

Amber stone is a miraculous work of nature, the beauty and mystery whereof attracted people even in ancient times. There are many songs and legends about amber; poets and scientists brought fame to it.
Million years ago large stands of forests in some parts of the world began to seep globs of sticky resin! This aromatic resin oozed down the sides of trees, as well as filling internal fissures, trapping debris, such as seeds, leaves, feathers and insects. As geologic time progressed the forests were buried and the resin hardened into a soft, warm, golden gem, known as amber. Amber is the fossilized resin of ancient trees which forms through a natural polymerization of the original organic compounds. Most of the world's amber is in the range of 30-90 million years old.

- Firstly, Baltic amber should be noted for the great variety of colour.
- Scientists count up to 250 different colours and shades of amber.
- Usually it is yellow but its numerous subtle shades can range from bright yellowish to dark brown, orange, reddish brown or almost white.
- Amber is not always of one colour: unique combinations of two or more colours and shades, patterns forming the most amazing compositions of art can be found.
- Amber stones and amber articles are flammable, sensitive to heat and effect of chemical substances therefore one should stick to elementary care rules.
- Like other things amber can lose its colour with the time if exposed to the direct light so it is recommended to store it in places protected from the direct sun light.
- In the course of time amber adornments can lose their gloss from the contact with skin but it is very easy to make it shine again by rubbing the adornments against woollen, suede or velvet fabric.

Amber beads in contact with skin accumulate an electrostatic charge and the oxidised surface contains the highest amount of succinic acid.
Succinic acid as a bio-stimulant has a positive effect on the respiratory tract, heart and kidneys; it also stimulates neural system and recovery processes.

Since high antiquity Lithuania is called "the land of amber". In ancient times amber was worth its weight in gold, and special caravans were carrying amber to Rome from the Baltic region.

- Amber cleans the environment in which it rests.
- When wearing, it brings purification of mind, body, and spirit.
- Amber activates unconditional love in mankind, stimulates the intellect, and opens the crown chakra.
- It is also a symbol of renewed marriage vows.

During the Greek Civilization, the Greeks mythologized amber as the tears of Apollo's daughters.

During the Roman Empire, amber was one of the reasons the Emperor Nero opened the trade routes with the Germanic tribes. Gladiators wore amulets of amber for protection while the ladies of the court dyed their hair to match their shades of amber.

During the Middle Ages, extreme measures were taken to control the amber trade. Gallows were erected along the Baltic Sea to hang amber pirates.

Amber stirs the world's genetic imagination because intact pieces of DNA, life's basic genetic code, have been extracted from insects preserved in amber millions of years old. As stated before, Baltic amber has been scientifically dated to be as old as 70-100 million years

Of all the amber deposits in the world, probably the most famous and certainly the largest is that of the Baltic region. It represents some 80% of the worlds known amber resource. Going back into prehistory this amber has been used and fashioned by humankind in countless ways and in measureless quantities.

Amber from this source can be found on the East Coast of Britain all the way to the far shores of Estonia. The Baltic amber deposits range between 35 to 40 million years old and is without the largest source of amber yet discovered.

Botanical Origins

The source of most of this amber has for many years presumed to be the extinct species of tree Pinites Succinifer. This conclusion was originally made by Aycke in 1853. However, as recently as 1985 Poinar and Haverkamp completed research involving infrared spectroscopy and drawing on earlier thin-layer chromatographic studies by Kucharska and Kwiatkowski cast some doubt on this long held view. Poinar et al speculate that probably more than one tree was responsible for the Baltic amber deposits.

Grimaldi in his latest book ‘Amber - Window to the Past’ refers to current research (not specified) which may at last resolve this mystery. Most Baltic amber possesses Succinic acid. This is a problem when attributing Baltic fossil resin to a species of pine, as up until recently no extant pine tree resin was known to contain succinic acid. But, two recent pine tree genera’s have been found which do possess succinic acid in their resin, they are Keteleeria and Pseudolarix. The latter has been discovered in the Eastern mountain ranges of China. An important and relevant observation is that the ecological systems which are supported by the Pseudolarix trees in China appear to reflect those presumed and extrapolated from the inclusions discovered in Baltic amber.

What is equally interesting is the presence of Pseudolarix pine cones in a fossil resin discovered on the Axel Heiburg island in Canada which also has succinic acid present. From this it can safely be presumed that this tree was capable of producing the resin which would transform over millions of years into amber. Pseudolarix is therefore beginning to look more likely as the true source of the Baltic Amber deposits.

Of the total amber obtained from this region approximately 90% possesses the Baltic amber signature chemical; succinic acid, which constitutes some 8% of the amber by weight, hence the official name of Succinite for amber originating from this region.

Succinite

(Named after Succinic acid which is present within this particular deposit). Succinic acid COOH(CH2)2COOH15 can be present from 3 - 8% by weight. Succinite is the correct name for the Baltic amber deposits situated from just off the East coast of England across to the shores of Lithuania. These deposits are huge and have been exploited now for hundreds of years.

It is still being mined or gathered extensively throughout the Baltic region. One of the most prolific mines is at the Palmnicken site in Russia which is still working and remains one of the largest producers. Records show that to date most, 90% of amber extracted is poor quality and requiring further processing into varnish. The remaining 10% is suitable for jewellers and artisan use.

Amber also had its ancient uses, and amongst other things was used as a varnish for musical instruments and oil paintings.The following link to the Amberalchemy web site explains the musical connection in more detail. Shellac is also a commercial derivative product of amber, more details can be found by taking the link.

Amber from the Cretaceous is rare, but Canada has some remarkable deposits originating from this age. Cedar Lake in Manitoba is probably one of the most commonly written about sites. The Cedar Lake deposits were found on the South West lakeside shore as washed and tiny pieces ranging from .5cm to 2cm in diameter. Highly fossiliferous by all accounts containing many examples of both flora and fauna.
Various scientific expeditions have brought back several hundred pounds of amber from this site. In the 1950’s a project was set in place to begin commercial development of the site. The venture later failed.

This site has now been lost to science because of the flooding of the area. The former lake side shore is now hidden beneath the new water level. Reports have been made of amber beginning to appear on the new higher shoreline. So far these reports have been unsubstantiated.

Dominican Republic Amber

Dominican Republic amber, probably the worlds second largest deposit, following that of the Baltic amber region, strangely does not **have a unique name but can be called amber because of the presence of Succinic acid though not to the same level as Baltic amber**. It is commonly referred to as Dominican Republic amber. Through out the island are numerous mines which tap into different deposits of amber. Laid down in successive layers the age of the amber extracted can vary from between 15 - 40 million years. The tree origin has been established by Poinar as Hymenaea protera.

COLOR IN AMBER

Many deposits produce amber which vary widely in their colour. Baltic and Dominican Republic amber being two primary examples

Baltic amber has such a wide spectrum of colour that a unique language has grown up to describe and identify different types of amber.

The Amber Forest

The size of the Baltic amber forest has been speculated upon by various scientific bodies and researches, amongst them being:

Barabara Kosmowska-Ceranowicz, Ph.D. of the Polish Academy of Sciences - Museum of the Earth.
Patty C. Rice, Ph.D. Author, 'Amber - the Golden Gem of the Ages'.
Åke Dahlstrom & Leif Brost of the Swedish Amber Museum.

Reviewing the content of this work the following map is offered as an amalgamation of their combined efforts and an averaging of their results.

the Baltic Sea and Scandanavian Penninsula.As you can see it occupied the greater part of
It can clearly be seen from this that the forest must have ranged over a huge area over a long period of time. It is unlikely though possible that during some periods it occupied the entire region simultaneously.
Despite this original position of the amber forest, fossil resin from this area has been discovered in: Poland, Germany, Lithuania, Latvia, Estonia, Denmark, Sweden, Holland, the United Kingdom and Belorussia, some areas are more prolific in their amber bearing strata than others. Significantly around the southern coast of the Baltic sea and predominantly the Samland Peninsula, particularly the Northwestern part of Kalingrad, an area of some 1280 square kilometres. This area actually

accounts for 90% Baltic Amber production. There are a number of reasons for this concentration, some are commercial and others natural.

When amber was first found to proliferate in this district individual private collectors soon turned into professional collectors/dealers. This ‘amber boom’ in the late medieval period lead to amber collecting laws, (Click here to read about the human history of amber) and from these early beginnings an industrial centre developed to which most amber was sent for processing and re sale. The Samland deposits were commercially exploited at a truly industrial level from the mid 19th century onwards.

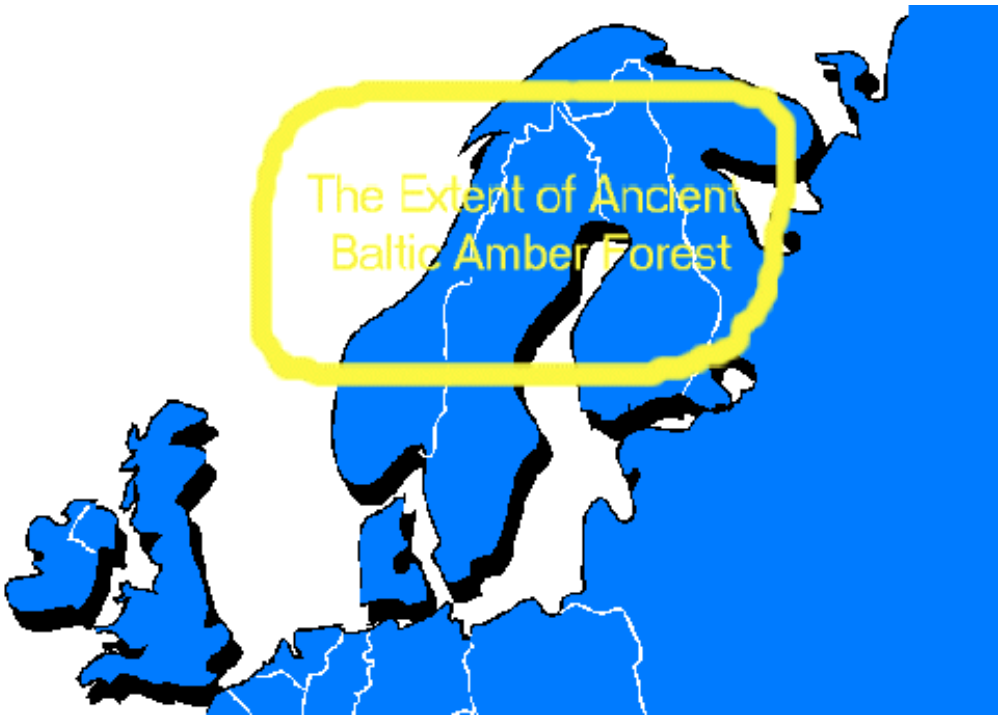
The geological reason for the concentration of amber in this region has been described by a number of authorities. N.O. Holst, the Swedish State Geologist referred to an ancient river called the ‘Alnarps’ which he wanted to call the ‘**Amber River**’. The river followed a fault in the geological strata taking a roughly Southeast route starting near the city of Ystad and it has been tracked as far as Northern Själland. Barabara Kosmowska-Ceranowicz has identified an ancient river course which she has named the ‘Eridanus’ and also an ancient delta at the mouth of the ‘Eridanus’, which has been called the ‘Chlapowo-Sambian’ delta. None of these geological entities exist today. The Delta spilled out into an ancient sea basin called the ‘Tethys’. It was here that the newly transported resin, in some cases still plastic and soft began its long metamorphosis into amber.

Both researches state that these ancient river courses are pre glacial and probably eroded the primary deposit sites of the amber, carrying the fossil resin down stream, eventually feeding out into an area, part of which we now know today as the Samland Peninsula.

The route of these ancient rivers is detailed in the following map. Holst’s ‘Alnarps’ and, Kosmowska-Ceranowicz’s ‘Eridanus’, both in Red, the ‘Chlapowo-Sambian’ delta is shown in yellow.

Properties

Baltic amber generally has the following characteristics;
Hardness: 2.0 - 2.5 Moh’s Scale.
Specific Gravity - 1.050 - 1.096
Refraction Index - 1.54
Melting point - 480/720Of (250/3800c)



Geological Occurence

The Samland Peninsula is famous for its ‘Blau Erde’ or ‘Blue Earth’ deposits within which the amber occurs. The ‘Blue Earth’ strata is located approximately 25-30 metres below the surface. On some areas of the coast, the ‘Blue Earth’ is much closer to the surface, on notable area being Palmnicken. The amber bearing layer must also outcrop on the sea bed in certain areas. After a strong storm out at sea or sever gales amber can be gathered from the beach. No doubt as a result of the currents tearing pieces out from the sea floor.

Confusingly the blue earth is in fact a green colour, a result of a mineral called Glauconite present in the soil, and nothing directly to do with the amber.

Here is a stratagraph showing the ‘Blue Earth’ in situ at the Samland Peninsula.

A Brief Human History of Amber

‘Pretty in Amber to observe the forms
Of hairs and straw and dirt and grubs and worms.
The things, we know, are neither rich nor rare,
But wonder how the devil they got there!’

Pope - Ep. Arbuthnot, 169.

Significant human cultural development is recognized as beginning in the Palaeolithic. This lasted from 1,000,000 years BC and lasted up to 8,000 years BC The earliest occurrence of amber being used or possessed by humans is from France in the form of un-worked lumps found in ancient caves in Hautes Pyrenees and also in other sites in southern European countries. None of these finds has so far shown any signs of crafting or carving.

The Baltic for much of this period was covered in glacier ice, but as this gradually thawed and retreated so the hunters moved ever further North in search of their quarry; reindeer and in the process reached the Baltic and the major source of amber in Europe.

It is reported in a number of books that the earliest occurrence of worked amber by man dates back to 7,000 BC and was discovered in West Zealand, Denmark. It was found in an ancient bog in a remarkable state of preservation as you can see in this external site picture, thanks no doubt to the anaerobic environment in which it had either been placed or fallen. The find is a pendant depicting four angular human figures and some striped patterning. Many of the Mesolithic articles depict human figures in one form or another.

David Grimaldi in his book Amber - Window to the Past cites an earlier occurrence however. According to Grimaldi the earliest worked pieces of amber were discovered in Southern England, near the Cheddar/Creswell crags in an ancient cavern called Gough’s cave. The age of these beads lies between 11,000 and 9,000 years B.C. placing them in the earlier Palaeolithic.

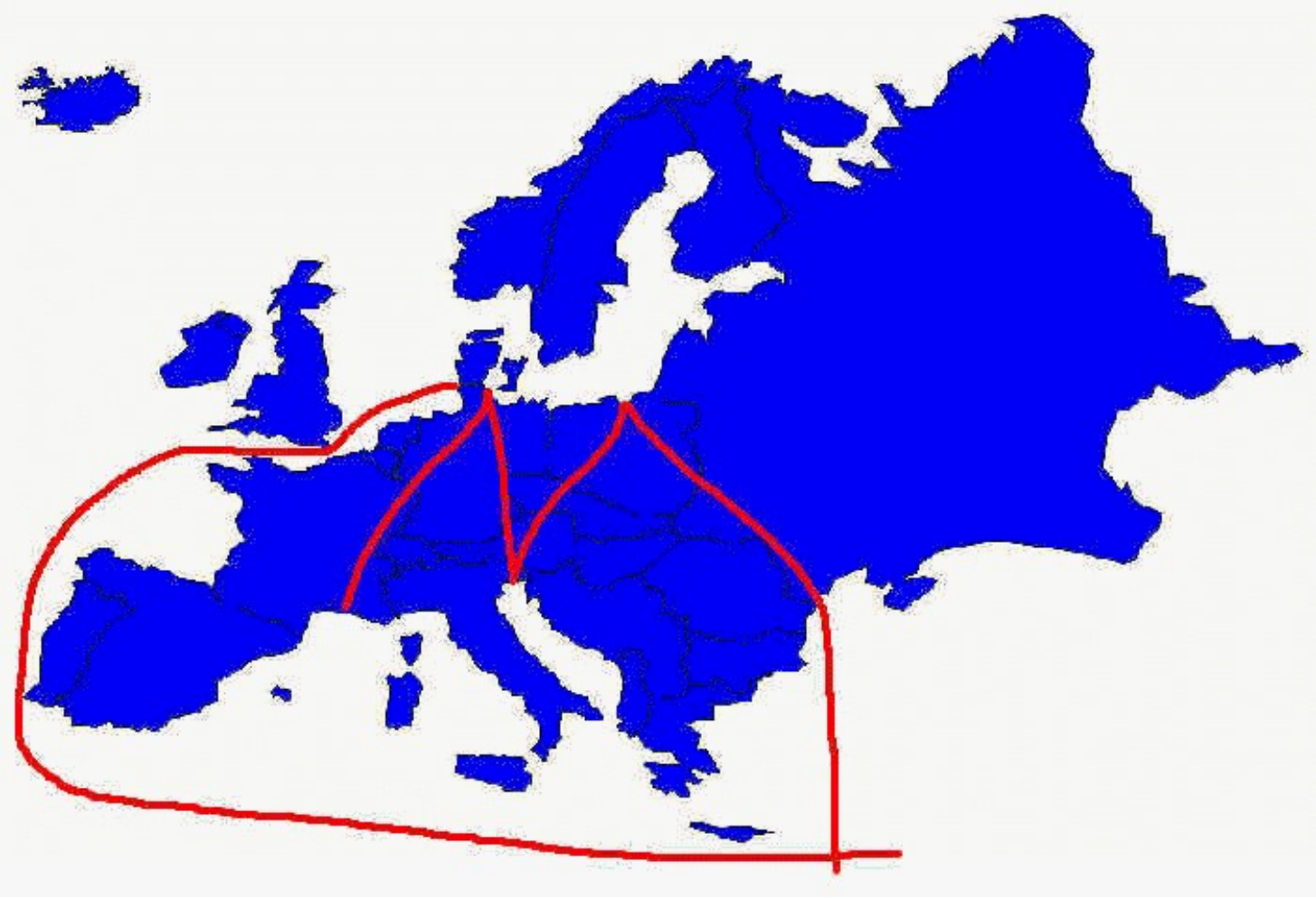
During the Palaeolithic and Mesolithic period amber was not thought to have been commonly traded but certainly amber did begin to be exchanged amongst the existing peoples of that time. Amber or more precisely Succinite has been discovered in many ancient sites as grave goods and lost artifacts.

From the Neolithic, 4,000 years BC to 1,900 year BC and into the Bronze age, 3,000 years BC to 1,000 years BC saw a remarkable expansion in the trading and distribution of Baltic amber. Farming began to supersede hunting as the predominate culture with larger settlements and villages beginning to appear. With this came an increase in trading and exchanging of commodities with other tribes and groups. Amber was no doubt one of these items.

The commencement of amber trading has been roughly established as beginning about 3,000 years BC though certainly as has already been mentioned some amber had been exchanged before that time.
It was during the Bronze Age that the famous amber trade routes were established. These were accepted ‘highways’, trade routes across the whole of Europe and extending into the Far East. These routes have been established by amber finds found in archaeological sites around and along

these ancient courses. No doubt the result of trading and exchanges done along these ancient tracks and roads.

It was from this period that it is thought the first amber reached the British Isles in the form of raw



amber or possibly pre worked beads. This excludes amber that already existed and was found on the East Anglia coast of England. It is important to remember that this was a post glacial period with population numbers only just beginning to increase following a long period of zero to low growth in this region.

It is also evident that amber began to play an important role in the cultural life of the peoples of this time. Its occurrence in grave goods and the prominence given to it clearly indicates that amber was held in some awe by these ancient societies.

Amber from the Baltic and this period has been found as far away as Greece, Egypt, Northern Ireland and Mesopotamia. The Egyptian amber has been dated to approximately 3,200 year B.C.

Schliemann reported finding large quantities of amber in his excavations of Mycenae and the fabled city of Troy.

One of the most famous and well-preserved finds from this time is the famous Hove Cup. This was recovered from a burial mound in Hove, a small town on the South coast of Britain. The find was a small round cup measuring 6.4 cm from top to bottom and 8.9 cm across. One of the best photographs of this find is in Grimaldi's book Amber - Window to the Past where its translucence and colour is well displayed. The cup has been dated to 1,500 years BC and is held at the in Royal Pavilion, Brighton.

The advent of the Iron age, approximately 1,000 years BC to 500 years BC saw a remarkable flowering in the quality of worked amber. Pieces discovered and retrieved from archaeological sites range from beautiful figurines and carved statutory through to brooches and jewellery which looks remarkably contemporary even today. The geographic distribution of amber from this period was extended still further across Europe and the middle and Far East.

Spekke in his book '**The Ancient Amber Routes and the Geographical Discovery of the Eastern Baltic**' attributes a significant amount of development and growth in Northern Europe to the resources put into and gathered from the trading of amber during this time.

The **Phoenicians were the major sea traders** at this time and amber was a prime commodity for them together with Tin. (The latter was possibly traded from the Cornish in the South West Peninsula of the United Kingdom.) The Phoenicians traded with the ancient Baltic peoples for the amber. No doubt the price they paid for this rare gem was significantly lower than the value they subsequently traded it on for.

Phoenicians went to great lengths to hide the source of their golden bounty and ancient literature tells stories of Phoenician Ships Captains wrecking their own boats when being shadowed and followed by rival traders trying to ascertain the source of the amber. (The first case of industrial espionage?)

Lucille Saunder MacDonald in her book 'Jewels and Gems' relates a story that Phoenician traders told to help shield their amber's origin.

'Now that the Phoenician's had seen the amber gathered from the sea, they determined to keep the secret for themselves and thus guard the lucrative trade. When the fleets returned to Syria, many were the tales told of perils to the north, of lodestones which would draw the ships to destruction on hidden reefs, of whirlpools which would suck them down to the bottom of the ocean, of witches who enchanted men by turning them into beasts, of terrible sea serpents, and awesome monsters. So well did these ancient sailors spin their yarns that for many centuries afterwards mariners feared these mythical perils'.

The Etruscans were a major trader of amber during these early times. A favoured use of amber was in the production of bronze and amber fibulae and particularly jewellery worn by Etruscan woman of that time.

References to amber from Greek literature abound. Homer's work 'The Odyssey' contain numerous references, for example:

'For Antonius his henchman bare a broidered robe, great and very fair, wherein were golden brooches, twelve in all fitted with bent clasps. And the henchman straightaway bore Eurymachus a golden chain of curious work, strung with amber beads shining like the sun' Book XVIII.

It was the Greek philosopher Thales around about 600 years BC who first documented amber's ability to attract small seeds, dust, pieces of cloth when rubbed against wool. The Greek word for amber was elektron and this gives us the route of the modern day word electricity relating back to this earlier discovery of static electricity.

There were many stories in Greece of where the amber originated. Mythology stated that the Heliades Sisters shed tears for the death of their brother Phaeton into a river called Eridanus which ran into a great sea (The Greek's interpretation of the Baltic Coast?) located in cold arctic north. Herodotus the famous Greek philosopher disputed this however, pouring scorn on the whole idea.

Italic and Greek interest in amber faded between 600 BC and 800 BC even during the classical period of Greek history. But the Roman Empire which began in 753 BC began to take up the interest in amber when the former declined. This was slow at first but amber artifacts have been retrieved from these early periods.

As the Roman Empire grew, plundered as well as traded amber began to flood into Rome. Most of the Roman amber antiquities recovered are as a direct result of the expansion of Rome's frontier borders. This reached its pinnacle in the immediate centuries before and after the birth of the man Jesus Christ.

Amber became such a prized possession that Pliny the Elder in his work 'Natural History' detailed at length the various myths and legends regarding amber's origin but unequivocally stated that:

'Amber is formed by the pith which flows from trees of the pine species, as a gum flows from cherry trees and resin from pines'.

A remarkable understanding that was to be lost and only re-established more than 1,500 years later. He also stated that the geographic origin of amber was -

' in the islands of the north of the Northern ocean that is called Glessum by the Germans, and that for this reason when Germanicus Caesar was commanding a fleet in those regions, the Romans gave the name of Glessaria to one of these islands'.

During the reign of the Emperor Nero a roman knight was dispatched to the far North to locate the source of the 'Northern Gold'. This was quite some feat at that time as the untamed regions of the Germanic tribes had to be negotiated and unknown territories traversed.

Pliny wrote;

'There still lives the Roman knight who was sent to procure amber by Julianus, superintendent of the gladiatorial games given by Emperor Nero. This knight traveled over the markets and shores of the country, and brought back such an immense quantity of amber that the nets intended to protect the podium from the wild beasts were studded with buttons of amber. Adorned likewise with amber were the arms, the biers, and the whole apparatus for one day. The largest piece the knight brought back weighed thirteen pounds.'

This was later to be recognised as a major influence in Rome's history as this simple but daring act opened up many northern trade routes which up until that time had not been exploited.

On the other side of the planet in China, amber was also playing a significant role in the life of the peoples there. Little literature in English exists but the American Anthropological Association published 'Historical Jottings on Amber in Asia' by Berthold Lauffer. This is a brief but descriptive account of amber in the literature of China.

The first reference to amber in Chinese literature was in the Ch'ien Han shu (Annals of the Former Han Dynasty) written by Pan Ku and after his death completed by his sister Pan Chao. It contains a reference to western countries and in particular Ki pin, which it states produces amber, Ki pin is in fact, Cashmir. The annal was written in 92 A.D. Trading relations between China and Cashmir began during the reign of Emperor Wu (140-85 BC) according to Lauffer and so it is likely that amber was traded into China at this time and perhaps a little earlier.

With the shrinkage and the eventual demise of the Roman Empire that was effectively complete by the early fifth century AD the Dark Ages swept in. Literary references to amber all but vanished. But amber and its place in society and art did not. Anglo-Saxon and Celtic crafts people produced some of the most beautiful and exquisite amber pieces despite the barbarity of times.

The retrieval of artifacts from graves, barrows and other archaeological sites shows ancient trade routes formed before the rise of the Roman Empire and lost during it, slowly beginning to be re-established.

Germanic culture (if we can use such a generic term to encompass such a broad cultural group) used amber extensively in its ornaments and jewels, as did the Anglo Saxons. But in the opinion of the author the use of **amber by the Celts was a pinnacle of amber craftwork.**

Amber began to make something of a comeback in the medieval period. The Teutonic Knights in 1283 became absolute rulers of Prussia and also created a monopoly on amber production within the Samland Peninsula. The major product became Paternoster beads. In fact the makers of this particular religious article even had their own job title; Paternostermachers.

The Teutonic Knights ruled the amber industry with an iron hand, to the extent that they forbade the collection of amber from the Baltic beaches on pain of death. The Beach Masters or Amber Lords enforced this law and there are many accounts of unfortunates who picked up amber and where hanged for it. The picture to the right is a copper engraving some 400 hundred years (1774) after this period. It shows that little progress had been made, Wagner the artist has drawn a group of amber gathers, note the two gibbets prominently displayed in the picture; top left, mid right.

In the ensuing years licenses and agreements were granted to different bodies and personages, the licenses were granted and retrieved over the following 500 years. Paternosters remained the staple amber product.

Bruge became one of the major centres of amber manufacturing. In the 14th century more than three hundred apprentice amber craftsmen were on record as working within the city.

By the end of the 14th century the sale of amber as well as the gathering was completely encompassed and controlled by the Order, to such an extent that within the city of Königsberg (Now Kaliningrad) a mining site, it was forbidden for anyone to own or possess any unworked pieces of amber.

The Teutonic monopoly was transformed over this period into a series of monopolistic Guilds. In 1480 the Danzig Amber Guild was formed. The Guild consisted of amber lathe turners who wanted to become another centre for amber working. The Teutonic grip still existed but was answerable to the King of Poland. The Order complained to the king about the granting of this license seeing it as either a challenge to the existing Guilds in Bruges and Lübeck or a further dilution of power. They failed to change anything.

A publication of 1491; 'Hortus Sanitatus' an ancient herbal book, shows an old wood cut of the fabled amber tree. Here you can see the tree appears to bearing some unusual fruit, as well as resin being exuded from the trunk.

One of the principles of control which was maintained throughout this time was the separation of the gathering of the amber from the working of the amber. This was applied with some rigour and artists wishing to work with amber outside one of the guild’s centres had to apply for a license to do so. It was as late as 1641 before this protocol was breached and Königsberg was officially granted a guild for working amber, the first place where amber was both extracted and worked in the same place.

In the 17th century the Baltic amber trade drew closer to becoming an industry. But the oppressive rule continued, the fisherman of the Baltic coast had to swear an oath to the state that they would turn in to the authorities anyone they knew guilty of illegally gathering amber.

The first major written work since classical times was published in the last quarter of the 17 century. Here is the front cover page of the same book written by P.J. Hartmann, entitled 'Succini Prusfici'.

1713 saw the creation of a legend, The Amber Room. Frederick William the First authorised the building of an entire room built of amber. Its' beauty became famous and was visited by Tsar Peter, who was greatly taken by its splendour. The room was later presented to him as a gift.

The Amber Room remained in the possession of Russia until 1944 when it mysteriously vanished. What happened is not fully known, it is known that the Russians had removed the amber panels from the room to a hiding and storage place in Novosibirsk. Invading Nazi soldiers discovered this. The room was crated up and transported to Kaliningrad. But in 1945 allied troops were about to move into Kaliningrad and the amber panels were moved again. Exactly where they were moved again is unknown. Much speculation and tales have been told of where they lie, if indeed they do still exist. Stories of new leads and new clues constantly re-appear in the press and for many people the hunt continue.

Today, the amber industry is expanding at an incredible rate. Some interesting facts were reveled in issue 27 of 'Inclusion/Wrostrek' newsletter:

'About 70% of the amber artifacts produced in 1996 worldwide originated in Poland, and of those - 805 in the region of Gdañsk. the number of amber factories in the Gdañsk region increased from 600 to 3000 between 1989 and 1996, the number of artists and workers from 700 to 8500, and the amount of raw amber used in the artifact production from 40 to 193 metric tonnes during that time.Most of the amber manufactured is imported from Samland (Russia). In 1959 only 6 metric tonnes of raw amber was used by 120 workers in 7 amber factories.'

As a result of trace fossils (Nannoplankton) present with the amber its age has been determined. (The dating of amber on its own is an imprecise science to date). The result of this research (Poinar - Life in Amber) is that Baltic amber ranges throughout the Eocene and Early Oligocene, a range of some 35 - 40 million years.

<u>New source of info</u>

GOLD OF THE NORTH

Name: english :amber (the name is derived from the old Arabic word "anbar"), french: ambre, deutsch: Bernstein, danish: rav, greek: elektron (if you rub amber on a cloth it becomes charged with negative electricity/ that`s the origin of the word electricity).

Fossil resin of coniferous trees (plinus succinifera) during Eocene/ 55 – 40 mil. years.

Origin: Here Baltic States/ main region: Jantarny (Russia) /before 1945 called Palmnicken/ East Prussia.

Exploitation: Opencast mining/ up to 900t per year/ only a small quantity can be used for jewelry.

Components: 80% carbon, ca 10% hydrogen, ca 10% oxygen, small quantity of sulfur.

Hardness: 2 – 2.5 Moh`s Scale.

Specific gravity: 1.05 – 1.10g/cm3.

Colors: all varieties of cognac and golden yellow from opaque to transparent, ivory-colored, brown, green (moss), black (contains bark of trees or floor coverings of the forest); rare: blue and cherry (The reason of opaque color are up to 900 000 small bubbles per square millimeter – if the sun heated amber the surface of the stone became weak and oxygen could leave – this process is called natural clearing. Today manufacturer didn`t have time: autoclave machines do this work in one or two days.) -Sun spangles are caused by different temperatures.

Speciality: When the resin was running down the tree small insects were included airsealed. So we have a focussed look at a part of flora and fauna 50 million year ago. The bodies of insects are hollow, what you see is only the skin.

Tests for genuineness: amber is swimming in a strong salt water or in Cola – plastic will remain on the bottom. Burning: amber has an aromatic resin taste, plastic is stinking.

Processing: most manual work; grinding of weather-beaten crust (oxidation) – shaping - polishing - drilling. Some methods with tumbling and vibrator machines.

Jewellery: Baltic amber is used as gem stone since the Mesolithic Period. In the Baltic region, the ancient Rome and the ancient Greece(Homer) amber was used for jewellery, for medicine and as a stone for spiritual healing. The Roman poet Plinius was angry about the price of amber " a small carved statue of amber is more expensive than a slave".
Articles made of amber: tumbled stones, hand grinded lumps , necklaces (round –baroque round-olive-cylinder-disk beads, small and big splinter), bracelets, pendants, Christian and Moslem rosaries, carvings, key pendants, letter opener etc.

Astrological aspect: stone of twin.

Possible healing effects:sore throat/ during theeting of little kids/ if you put amber in water or wine for 1-14 days, the liquid shall be good against stomach-ache/asthma/ stypic (so the literature).

Attention: If your amber jewel isn`t shining polish it with toothepaste!

THE PLACES WHERE AMBER IS FOUND: Amber is found in all parts of the world. The most important place is the so called "amber province" by the Baltic Sea. It is 2000 kilometres long and 500 kilometres wide. Amber has been picked up here since the historical times. A lot of historically valuable decorations and decorative articles were made of amber. The so called "amber room" probably was the most famous and it was made in 1701-1709 in Prussia. In 1716 it was given as a present to Peter I, tsar of Russia, and in 1755 it was carried to the tsar's residence. Touring World War II it was carried to Kaliningrad and has disappeared since that time.
PROCESSING: Circles (disks), balls, decorative haberdashery articles, facet grinding
MINERALS SIMILAR TO AMBER: do not exist
IMITATIONS: Bakelite, celluloid, epoxy, copal
IDENTIFICATION: Characteristic colour and weight
ADVISE: Sensitive to heat, combustible, reacts with chemicals. In the course of time loses its brilliancy which can be restored by friction with the fabric.
ASTROLOGY: Leo. Almost all can wear except Taurus.
CHACRA: navel
INFLUENCE ON THE BODY: helps to cure diseases of the urinary system, stomach and bronchitis.
MAINTENANCE: discharge in the warmish water.
ORIGIN: fossilised tree resin

Source of information about amber

Natural Baltic amber is famous for its large number of varieties. The variety of color and degrees of transparency were obtained in the varied conditions during its travel to the consecutive deposits. Whether warmed by the sun, weathered by the sand due to changes in humidity and oxidation, or pressed by the glacier, the amber obtained in a natural way all the beauty which people now try to enhance artificially as they follow fashion trends. Many methods have been developed for obtaining the clarity of amber, or the color of cognac, or the black amber. After the treatment, it still possesses the features of succinite, so we can call it real amber, but not natural amber.

Natural Baltic amber is a living stone. The processes of vaporisation, polymerisation, isopolymerisation, and oxidation, which caused the once liquid resin to harden so much that it can be ground and polished, have not yet ended. Probably this constitutes the beauty and healing effect of the stone.
On the current amber world market, products made from fossil resins similar to amber are being promoted, in addition to succinate ones. In Germany a large range of decorations is made from copal which is imported from the southern hemisphere. They are very similar to decorations made

from Baltic amber, especially when they are finished with a thin layer of special varnish. The forgery can be easily recognized for, unlike true amber, the copal articles dissolve, for example in acetone. Also being much softer, their surface wears off and they quickly become dull. The decorations made from the so-called Dominican amber have similar characteristics. This type of amber originates from the island of Hispaniola and has been known on the market for some decades. It is a resin, which differs greatly from succinite and has no tradition of artistic handicraft.

On the contrary, Baltic amber has been bound up with the cultures of human societies from very early days. At Niedzwiedziowka, a village 30 kms east of Gdansk, a Neolithic amber region was found. Documents show that 4, 500 years ago, 900 workshops existed on one square kilometer of the village. In ancient times, there were regular amber routes, leading to the Vistula estuary from first Greece and then from the Roman Empire. Amber was a constant feature of ancient cultures. Its Greek name elektron expressed admiration for its magnetic properties and the fable of amber originating from Heliadic tears has moved the hearts of people for hundreds of years.

Gdansk was for many centuries a center of artistic amber production. The master-craftsmen of this city created their masterpieces on the orders of the highest social classes: supreme sovereigns, the aristocracy, or the highest clergy. Large caskets, furniture, altars, and reliquaries roused admiration by their composition, perfect execution, and rich iconological design, but mainly by the beauty of the material.

The largest amber object ever made — the famous Amber Room in Carskie Siolo, was initiated by a Gdansk master Andreas Schluter and the most difficult work, the large panneaux covering the walls, was carried out by Gdansk masters, Gottfried Turau and Ernst Schacht.

Baltic amber comes in a wealth of varieties produced by the great differenced in the degree of its translucency and colour – from pale yellow through numerous shades of yellow to white, bluish, greenish, beige and brown. These are among the factors which make amber such a highly desirable and valued raw material in the fold art and jewellery trades.

Baltic amber varieties can be divided into primary and secondary. The fundamental criterion in distinguishing the primary varieties is the internal structure of the amber, which constitutes the key to establishing its colour and translucency, as well as the degree to which it is contaminated by organic inclusions. The translucency and colour of amber depend on the amount of air bubbles contained within a given piece of amber and their distribution.

Among the rich collection of Baltic amber housed in the Museum of the Earth, the following primary varieties are particularly noteworthy:
Transparent amber – this variety does not contain any air bubbles or only single, fairly large ones measuring 0.5 – 2.0 mm in diameter.

Translucent amber – parts of which contain large concentrations of air bubbles producing a clouded appearance.

Opaque yellow amber – the number of air bubbles in this variety reaches 25,000/mm2, its colour ranging across all shades of yellow and beige.

Opaque white amber – containing up to 900,000 air bubbles per mm2, with an internal structure which has the appearance of solid foam. The colour of this variety ranges from white to blue.

Amber contaminated by organic matter and wood splinters forms a separate category among the primary varieties. The types of amber belonging to this category are known as the earth varieties, even though they have nothing to do with soil, or are sometimes referred to as clinker. These varieties are classified independently of their internal structure. Earth amber frequently contains numerous air bubbles which were produced during the decaying process and sometimes also contains plant and animal inclusions. Earth amber is usually either **brown or greenish** in colour. The internal structure and colour of primary varieties of amber is subject to change dependent on air, humidity and light levels and other weathering processes which can turn it from yellow to red or orange. Changes in its internal structure lead to the appearance of numerous cracks within any given piece, resulting in what is referred to as a sugar – crystal structure. Weathered amber is also covered by a "cortex" or "crust" making its surface coarse and uneven. The greatest degree of weathering is displayed by amber which has lain in deposits above the surface of the water-table for a prolonged period of time. Similarly, pieces of amber which make up part of an old collection, or those which have been exposed to the effects of light, as is often the case with display items, change colour from yellow to red and orange, or from white to yellowish.

In the drainage-basin of the River Narew, where the tradition of collecting and working amber goes back to the fifteenth century, a wide-ranging terminology is used to describe amber, taking into account its colour and level of translucence. In his Pocket Dictionary of Polish Amber Varieties, **Chetnik brings together eighty names for varieties of amber, which refer not only to their colour and translucence but also to the character of their surfaces, their degree of weathering, provenance and even their suitability for working and their role in folk rituals.**

Chetnik makes the following distinctions between varieties of transparent amber: gems – entirely transparent, pale yellow amber; flames – reddish amber whose colour is reminiscent of fire; honey – honey-coloured amber; clouded – amber which has concentrations of opaque areas which resemble clouds in a clear sky.

- Translucent amber includes nebular and woolly varieties in which the opaque sections appear in strips or concentrations reminiscent of fluffy clouds or strands of wool.

- Varieties of yellow, opaque amber include beige amber – a reference to its colour – and cabbage-leaf amber – where pale yellow or white streaks appear distributed on a darker yellow background giving the effect of veins on a cabbage leaf; patchy amber – in which different shades of yellow or white form distinct patches of colour; marbled and mosaic amber – where multicoloured portions are arranged in patterns resembling marble or mosaics; and finally mixed amber which consists of several varieties rolled into one piece. Grainy and striped amber is a name given when sections of various colours and degrees of translucence form stripes or rings which resemble the grain of wood.

- Opaque, white varieties include chalky amber – chalky white in colour; bone amber – predominantly white with a hint of yellow, giving it the appearance of ivory; and unique

specimens of blue amber. These contain such a large amount of air bubbles that seen under an electron microscope they have the appearance of solid foam.

- Amber belonging to the earth category, i.e. that which has been contaminated by plant matter, is divided into the following varieties; dappled – containing small particles of grey or black plant detritus; transparent earth amber – containing detritus particles and large, single air bubbles which are clearly visible against a transparent, yellowish-brown background; green amber – which has a greenish hue; and mixed earth amber – which contains fragments of opaque, yellow amber contaminated with interspersed plant matter.
- Sugar-crystal amber, so-called because of its granular appearance and red amber; are easily distinguished amongst the secondary varieties of this mineral.

Amber has a very rich history. It was already a valued raw material in the Early Stone Age (Palaeolithic) and was used for the production of ornamental goods for many centuries in all the major cultures of Europe, the Middle East, Asia and the Far East.

Amber also played a role in numerous religious beliefs. Dependent upon their shape and form, researchers consider amber objects found during excavation of early sites to have been of significance in various cults. The solar cult was linked to fertility. One of the attributes of this cult was flat, round amber discs decorated with a series of dots applied in the shape of a cross. Amulets in the shape of small axe-heads (occasionally double-headed miniatures), which were worn to ward off danger, are thought to have been associated with the battle-axe cult. Zoomorphic figurines probably served as protective amulets safe-guarding their wearers against any dangers they may have encountered whilst hunting. Anthropomorphic female figurines were a schematic representation of a “mother-goddess” and a symbol used in fertility cults. Male figurines and phalluses probably had some association with the ancestor cult or were used as representative symbols of gods and heroes.

The ancient Greeks and Romans both believed in the magic powers of amber. It was thought that its electrostatic energy also had the power to draw all manner of misfortune away from people. Tiny pieces of amber have been discovered inserted beneath the skin covering the hands of Egyptian mummies.

The Egyptians believed that amber secured the mummy against destruction and decay. Amber amulets have also been found in ancient graves, where they were placed in order to protect the dead in the afterlife. To this day, Zuni Indians produce a variety of amber amulets, occasionally combining them with other semiprecious stones, such as turquoise, for artistic effect or maybe ritual purposes. The belief in the power of these talismans to safeguard and protect is one which is not only popular among Indian tribes, but is also gaining favour in other societies, e.g. Germany and Japan.

The conviction that amber possesses remarkable properties has lasted for many centuries and is still evidenced in folklore. In the Kurpie region, a bridal necklace has to include at least one amber bead with an organic inclusion. This bead is known as a meddler and serves as an amulet. Amber necklaces are handed down from generation to generation with great ceremony and reverence in Kurpie and Cashubian families.

Callistratus states that a short string of amber beads worn around the neck brought relief to the wearer in some cases of severe head, neck and throat complaints. Wearing amber bracelets was thought to be beneficial to sufferers of rheumatism and arthritis and reduced fatigue and feelings of general weariness. A similar effect was said to be achieved by rubbing the body with a fairly large piece of the mineral. Various other creams, balms and infusions of amber steeped in alcohol were also recommended for external use. All manner of concoctions, of which amber was the main ingredient, were also widely used to remedy respiratory complaints, asthma, bronchitis, bowel and bladder disorders, heart problems and ailments of the circulatory system.

In nineteenth-century literature we find evidence of amber having been used as a remedy for virtually all illnesses. Haczewski wrote that amber was one of the six more efficacious medicinal substances. Amber is probably the only stone which is considered to be of such great use in medicine.

In today's era of "healthy lifestyles," when everything that is "closer to Nature" is in vogue, using every available natural product has become very popular. Thus, it comes as no surprise that medicines whose main ingredient is amber are in such great demand at homeopathic chemists. The cosmetics industry has also jumped on the amber bandwagon, using this mineral in an ever wider range of creams, tonics and treatments which are easily absorbed into the skin's deeper layers.

After the partition of Poland, a retrogression took place in the economy and culture of Gdansk which, losing the rank of the main port of a large state, became a port of secondary importance of Prussia. Most of the amber workshops were liquidated, and the remaining ones changed into workshops for the mass production of necklaces of lathe-turned amber balls.

The fate of the amber industry was adverse until the end of the 1980s. A series of wars, isolation from the markets and, above all, the strangling of any initiative by the pro-Soviet regime, merely allowed a few amber craftsmen to drag out a wretched existence.

The situation changed radically in 1989, when Poland won its sovereignty and economical freedom. It was Gdansk that initiated the fight for political and economic changes, and it is difficult to say to what degree the siting of the amber center in Gdansk influenced the explosion in amber production. But the figures speak for themselves. In seven years the number of amber workshops rose from 500 to 6,000, and the value of their production increased over 50-fold. A few hundred trained artists create new designs and original works of art such as sculptures, furniture, and jewelry. Many of the workshops direct their efforts to the maintenance of those artifacts that remained and to create works based on the tradition of the "golden age," that is, from the sixteenth to the eighteenth century.

Getting rid of the state control of silver (Poland is one of its main producers) allows Polish artists to make jewelry, vessels, and articles of everyday use, decorated with amber in an unheard-of range of designs and functions. The great number of individual workshops offers products suitable to any demand or purse — from simple souvenirs to great works of art.

Some notes on baltic amber

Baltic amber is a resin produced about 30 to 40 million years ago by a pine tree by now extinct, pinus succinifera, that grew in territories now invaded by the sea (succinum is the old latin world for amber, electrum the greek one).

During violent storms the amber, burried under layers of earth and sand, is torn out the seabed (thixotropie) and deposited on the shores (the specific weight of amber is between 1,05 and 1,10, thus lighter than sea water). Since times unknown people pick it up and put it for sale.

In the late 1600 consistent deposits were found inland. These are still active and furnish most of the amber on the market today.

Although most of its secrets have been unveiled the amber is still object to empiric practices, as remedy for impotency (just keep a piece of amber in your pocket !) nervous or digestive disorder or as ingredient for beauty creams.

The American Museum of Natural History entitled its web page on amber "Amber, Window to the Past", summarizing very well the emotional and scientific content of this warm "stone": through this window you may bring to life again the tragedy of the small insects trapped in the amber, know their habits, their environment, the vegetation, climate and with a little help of your imagination find yourself in this world gone by long ago.

In order to verify genuine amber there are some simple tests:

- salt water test: genuine amber will float in a mix of water and cooking salt

- needle test: heat read the tip of a needle and touch the sample: plastic will have a bad smell whereas amber and copal smell of resin

- alcohol test: amber, contrary to copal or other resins does not dissolve in alcol or ethyl oxide

- nail test: your finger nail may sign copal but not amber.

The importance of amber in science, culture and art, has long and grand traditions. Amber is fossil resin. Baltic amber owes its exceptional reputation to its fascinating history, spanning the period from the times when it was sticky resin in Tertiary forests at least forty million years ago to the point when it was found as a small solid piece on the Baltic beach.

Bulky pieces of Baltic amber can weigh more than 3 kg. Icicles and other dripstone forms, as well as tiny beautiful drops, seem to convince one that they really are the tears of mythological Heliads.

The Tertiary forests were large and produced great amounts of resin. They consisted of coniferous trees from the Pinaceae family, resembling such species as today's Cedrus (cedar from the Atlas mountains) and Larix (larch). These amber-yielding forests grew in Northern Europe. The most extensive deposits of Baltic amber in Eocenian blue mud occur in the Sammbian Peninsula and by the Bay of Gdansk

Unlike other kinds of amber in the world, Baltic amber is marked by a wealth of varieties. This resulted from its internal structure, inclusions and degree of weathering. Dictionaries of folk names provide aproximately one hundred (100) names describing transparent, translucent and opaque amber with a multitude of hues, in yellow, red, brown, beige and white, as well as bluish and greenish tints, which sometimes create unique mosaics.

Baltic amber has been used as material for ornamentation since Palaeolithic times. In Poland, in the region of Zulawy, alone approximately 100 amber treatment sites dating back to Neolithic times have been found. The exceptional qualities of succinite were also appreciated by ancient Mediterranean culture and in the course of time this particular type of amber reached all corners of the world. In a few thousand years it became the most valuable and the most widely used decorative stone.

Baltic amber is not only a precious stone, but also a witness of life dating back to at least 40 million years. Inclusions in the form of small animals and fragments of plants are great material for paleontologists and a subject of interest to hobbyists and collectors.

Some of the inclusions still have their original three-dimensional form and may be examined as closely as any contemporary specimens. Today, just like ages ago, amber is one of the most highly valued and fashionable precious stones in the world.

Artistic amber works decorated royal chambers. Impressive cabinets, chests, chandeliers and reliquaries became typical furnishings in the mansions of the nobility.

The unparalleled variety and beauty of Baltic amber colors has a beneficial influence on our health. Amber jewelry is often worn with casual clothes, while its more more luxurious and extravagant versions are used as ornaments for special occasions.
Many outstanding designers work in amber. It is also material for artists creating unique works of art. Amber is set in gold and silver, often in combination with other precious stones.

In the Baltic lands in the New Stone Age and in the old Bronze Age raw amber was processed in three major centers - in Sambia Peninsula, Prussia; in the village of Šventoji, Lithuania; and in the villages around the Luban lake, Latvia.

FIGURE OF A MAN ? (3000 years B.C.)

In the early Middle Ages amber rosaries and small crosses were made. The use of amber for making of works of art became especially popular in the 17th - 18th centuries. By that time artisans learned how to cut and polish and shape amber on a lathe. The biggest part of famous works was manufactured in the Dancig workshop.

In the 9th-13th centuries, with the spread of handicrafts in Lithuania, artisans specialising in the processing of amber appeared. Palanga was one of the most important ancient amber-processing centers. Before World War I in Palanga normally 20,000 kg of raw amber were processed per year and 300-500 workers were employed in this industry. There were also many individual artisans and an amber factory in which about 80 workers manually made different adornments, cigarette holders, crosses, rosaries. Amber beads were exported to African and Asian countries and brooches and cuff links and other articles were exported to Scandinavia, Holland and France.